CLAIMS

1. Device for surveying the pressure of fluids housed in tanks or flowing through ducts, characterised by the fact that it comprises the following elements:

a connecting body (2) with an axial symmetry;

connecting means (5b) connectable to ends (4, 9) of tubes coming from containers or pipes (101) to send a fluid to the body (2);

an external envelope (1), with an axial symmetry, housing the connecting body (2), the external envelope (1) sliding on the body (2) from a first distal position to a second position proximal with respect to the body (2) according to the action of an external force (F);

self-closing means (15) capable of sealing an entrance room (14) located between the connecting means (5b) and a measuring chamber (30);

a manoeuvre member (21) mechanically connected to the external envelope (1), the manoeuvre member (21) allowing that the self-closing means (15) opens the entrance room (14) when the external envelope (1) slides form the first distal position to the second proximal position; the manoeuvre member (21) allowing the closing of the means (15) when the external envelope (1) is in the distal position , and the relative pressure in the measuring chamber (30) is lower than a first pre-established threshold value (Pci);

the measuring chamber (30) contains the fluid of the container or pipe (101) coming through passages (23, 24), from the entrance room (14) when opened by the manoeuvre member (21); at least the force of the pressure of the fluid acts in the measuring chamber (30); the manoeuvre member (21) closes the connection among the measuring chamber (30), the ends (4, 9) and the external environment;

a deforming element (28) sensitive to the forces acting in the measuring chamber (30), the deforming element (28) being capable of moving the manoeuvre member (21) together with a rigid member (22) guiding the deforming element (28);

a space (25) connected to the environment and housing a spring (27), the space (25) is found in a position opposite to the measuring chamber (30) so that the spring (27) acts o the deforming element (28) contrasting at least the pressure force in the measuring chamber (30) on the deforming element (28); therefore, when the manoeuvre member (21) is in a position proximal with respect to a support (17) and the relative pressure in the measuring chamber (30) is lower than the first pre-established threshold (Pci), the force of the spring (27) exceeds the

contrasting forces acting on the deforming element (28), and the element (28) moves the manoeuvre member (21) towards a distal position allowing that the self-closing means (15) to seal the entrance room (14);

passages (23,24,25,26a,26b,26c) are further provided connecting the measuring chamber (30) to the environment, when the self-closing means (15) close the entrance room (14).

2. Device as in claim 1, wherein a spring (3) is housed by the measuring chamber (30); the spring (3) is located between the end (33) of the connecting body (2) and a supporting basis (35), integral with the external envelope (1) for pushing said external envelope (1) towards a first position distal with respect to the end (4); in the distal position a limit stop (34) of the external envelope (1) is in contact with the body (2).

3. Device as in claim 1, wherein the measuring chamber (30) is delimited by a first movable diaphragm (28), a rigid member (22), the connecting body (2), the external envelope (1) and a second movable diaphragm (31).

4. Device as in claim 1, wherein measure mechanisms are further provided acting according to the equilibrium of the forces of the relative pressure in the measuring chamber (30) and of elastic elements (27, 46, 47, 48) contrasting said forces of pressure; the forces of the elastic elements (27, 46, 47, 48) are prefixed by means of the contact with rigid supports (38,56,57), in order to obtain easy determinable and repetitive in the time elastic reactions.

5. Device as in claim 1, wherein a rigid support (38) consists of a basis (38) fixed by a wall (39) integral with the external envelope (1).

6. Device as in claim 1, wherein the entrance room (14), feeding a valve with three ways and two positions, and the space (25), connected to the environment, are always separated; the entrance room (14) is connected to a cavity (9) located at the extremity of the end (4), while the space (25) communicates with the environment.

7. Device as in claim 1, wherein the valve with three ways and two positions comprises a self-closing diaphragm (15) held by a seat (17a), located between a first support (17) and the connecting body (2).

8. Device as in claim 1, wherein the valve with three ways and two positions further consists of the self-closing diaphragm (15) having a surface (16) sealing the entrance room (14) when said surface (16) is in contact with an edge (18) of a head (19), disposed at the extremity of a pin (20) integral with the connecting body (2); the pin (20) crosses a hole (15a) located in the self-closing diaphragm (15).

9. Device as in claim 1, wherein the manoeuvre member (21) acts on the valve with three ways and two positions for commuting from the closing condition, in which the entrance room (14) is separated from the measuring chamber (30), and the measuring chamber (30) communicates with the environment, to the opening condition, in which the entrance room (14) communicates with the measuring chamber (30), and the measuring chamber (30) is separated from the environment.

10. Device as in claim 1, wherein sensors are further provided commuting from first to second conditions of equilibrium to emit signals depending on the instantaneous value of the relative pressure of the fluid; the sensors being capable of sensing thresholds (Padvi,Pci,Pcs) of different valued of the relative pressure of the fluid founding in the measuring chamber (30).

11. Device as in claim 1, wherein the sensors are sensitive of the force of the relative pressure in the measuring chamber (30) transmitted to the sensors through the second movable diaphragm (31).

12. Device as in claim 1, wherein the sensors consist of sliders (43, 44, 45) resting on the second movable diaphragm (31), of elastic members (46, 47,48), of contacts (52,53,54) supported by the sliders (43,44,45) and of contacts (49, 50, 51) fixed to the basis (38); if the value of the relative pressure in the measuring chamber (30) exceeds a threshold value (Padvi,Pci,Pcs), the contacts (52,53, 54) supported by the sliders (43,44,45) touch the contacts (49,50,51) fixed to the basis (38) for defining a first electric condition; vice-versa,if the value of the relative pressure in the measuring chamber (30) is lower than the threshold value (Padvi, Pci, Pcs), the contacts (52, 53, 54) supported by the sliders (43, 44, 45) are detached from the contacts (49, 50, 51) fixed to the basis (38) for defining a second electric condition.

13. Device as in claim 1, wherein said electric conditions are transmitted to the basis (38) fitted with electric circuits and apparatuses processing the electric conditions of the contacts (52,53,54) and (49,50,51) to obtain signals to be transmitted.

14. Device as in claim 1, wherein the sensors are housed in a cavity (40) joined to the environment for reference the value of the pressure in the measuring chamber (30) to the value of the environment.

15. Device as in claim 1, wherein a bushing (21), integral with the rigid member (22), opens the self-closing diaphragm (15) to commute the valve with three ways and two positions from a first condition defined by the disjunction of the bushing (21) from the self-closing diaphragm (15) to a second condition in which the contact

between the edge (21a) of the bushing (21) and the surface (16) of the self-closing diaphragm (15) seals the communication between the cavity (23) of the bushing (21) and the space (25).

16. Device as in claim 1, wherein the commutation of the valve with three ways and two positions in the second condition occurs when the bushing (21), in contact with the surface (16) of the diaphragm (15), acts on the diaphragm (15) with a push sufficient to translate the surface (16) towards the entrance room (14) which is in communication with the cavity (23).

17. Device as in claim 1, wherein the rigid member (22) is fitted with internal ducts (24, 24a, 24b) to connect the entrance room (14) to the measuring chamber (30) through the cavity (23) when the forces acting in the measuring chamber (30) exceed the spring (27).

18. Device as in claim 1, wherein an interspace (58) is provided being obtained by increasing the radial dimensions of the external envelope (1) to keep on providing the advantage consisting in the shortening of the total length of the device (100) and to maintain the counter spring (3), disposed between the connecting body (2) and the supporting basis (35), integral with the external envelope (1).

19. Device as in claim 1, wherein a first Belleville washer (59) is provided acting on the rigid member (22) contrasting the action of at least the force of the pressure in the measuring chamber (30) on said rigid member (22) and the first movable diaphragm (28).

20. Device as in claim 1, wherein a second Belleville washer (60) is provided acting on the first slider (43).

21. Device as in claim 1, wherein the connecting body (2) is separated in two portions, a first portion (2a) is fixed to fasten the device (100) on the end (4), and a second portion (2b) is movable to axially translate both with respect to the fixed portion (2a) and with respect to the external envelope (1).

22. Device as in claim 1, wherein a flange (73) is realised at the end of a protuberance (66), integral with the movable portion (2b) of the body (2); a gasket (74) is located between the flange (73) and an end (75), integral with the fixed portion (2a) of the body (2); the gasket (74) seals the flange (73) with the end (75).

23. Device as in claim 1, wherein the body (2) houses a cavity (65), in which the protuberance (66) axially translates.

24. Device as in claim 1, wherein a hollow sleeve (70) is integral with the movable portion (2b) of the body (2); the internal wall (71) of the hollow sleeve (70) axially

slides with respect to a peripheral wall (72) of the fixed portion (2a).

25. Device as in claim 1, wherein the internal wall (71) is coupled to the peripheral wall (72) with a sufficient accuracy, therefore the hollow sleeve (70) forms a guide for the movable portion (2b).

26. Device as in claim 1, wherein the counter spring (3) is housed in an interspace (61) out the hollow sleeve (70); the space (25) is permanently connected to the environment through the duct (26a), obtained in the first support (17), the duct (26b1) located in the movable portion (2b), the camera (63), the duct (26b2) obtained in the fixed portion (2a), the duct (26b4) obtained in the movable portion (2b), the interspace (61) radially obtained in the movable portion (2b) to house the counter spring (3), the duct (26b3) obtained in the fixed portion (2a) and the duct (26c) obtained in the external envelope (1).

27. Device as in claim 1, wherein the second slider (44) is integral with the third slider (45) for forming a sole fourth slider (80), free to axially move between a distal position and a position proximal with respect to the basis (38).

28. Device as in claim 1, wherein the fourth slider (80) is in the first position distal with respect to the basis (38), the distal position being the position of equilibrium reached by the fourth slider (80) when the environmental pressure acts in the measuring chamber (30); the first distal position of the fourth slider (80) is reached because of the reaction of the first elastic member (47) contrasting with the strength to the deformation offered by the second movable diaphragm (31); the second spring (60) keeps the first slider (43) pressed against the second movable diaphragm (31) in the first position distal with respect to a second support (37).

29. Device às in claim 1, wherein the first elastic member (47), located between the fourth slider (80) and the basis (38), keeps the fourth slider (80) pressed against the second movable diaphragm (31).

30. Device as in claim 1, wherein the second elastic member (48) is located between the fourth slider (80) and the contact (54).

31. Device as in claim 1, wherein a fourth slider (80) comprises the joined second and third sliders (44, 45); the first elastic member (47) is found between the fourth slider (80) and the wall (81), connected to the first slider (43); the reaction of the first elastic member (47) discharges on the first slider (43), and the fourth slider (80) is free to axially move between a distal position and a position proximal with respect to the basis (38).

32. Device as in claim 1, wherein a plate (85) is disposed between the rigid member

(22) and the first Belleville washer (59); the plate (85) is free to axially translate with respect to the rigid member (22) between a distal position and a position proximal with respect al first support (17).

33. Device as in claim 1, wherein the rigid member (22) and the plate (85) are separated to uncouple the actions regarding the seal of the gasket (91) for separating the chamber (99) from the chamber (25).